

This listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Currently amended) A method of forming a Ge-containing structure, the method comprising the steps of:

providing a substrate having a first and a second surface;
forming a ~~Ge-based~~ layer comprising Ge over said first surface; and
forming a stress engineering layer over said second surface, ~~so as to~~
wherein the stress engineering layer increases a ~~[[the]]~~ tensile strain of the Ge-containing ~~[[based]]~~ layer ~~over the first surface.~~

2. (Currently amended) The method of claim 1, further comprising the step of:
forming a second layer comprising ~~Ge-based layer~~ over said second surface before forming the stress engineering layer.

3. (Currently amended) The method of claim 2, wherein the step of forming the stress engineering layer comprises forming a germanide layer using the second Ge-containing ~~[[based]]~~ layer formed over said second surface.

4. (Currently amended) The method of claim 3, wherein the step of forming the germanide layer comprises depositing a ~~[[Ti]]metal~~ layer on the second Ge-containing ~~[[based]]~~ layer formed over said second surface and forming the germanide layer via solid phase reaction.

5. (Cancelled)

6. (Currently amended) The method of claim 2, further comprising removing the second Ge-containing ~~based layer over said second surface~~ before forming the stress engineering layer.

7. (Cancelled)

8. (Currently amended) The method of claim 2, wherein forming said first and second Ge-containing ~~based~~ layers ~~are formed~~ comprises using ultra-high vacuum chemical vapor deposition (UHV-CVD).

9. (Currently amended) The method of claim 1, wherein said Ge-containing ~~[[based]]~~-layer comprises a Ge layer~~[[s]]~~.

10. (Currently amended) The method of claim 1, wherein said Ge-containing ~~[[based]]~~ layer comprises a SiGe layer~~[[s]]~~.

11. (Cancelled)

12. (Currently amended) The method of claim 1, wherein said stress engineering layer allows a direct band gap of the Ge-containing ~~[[based]]~~ layer of less than or equal to about 0.766 eV.

13. (Cancelled)

14. (Currently amended) The method of claim 1 further comprising forming ~~an oxide or nitride~~ dielectric layer over said Ge-containing ~~[[based]]~~ layer followed by high temperature annealing.

15. (Currently amended) A SiGe-containing structure comprising:
a substrate,
a SiGe layer ~~that is~~ disposed over a first surface of said substrate, and
a ~~silicide or germanide~~ stress engineering layer comprising at least one of silicide and germanide ~~that is~~ disposed over a second surface of said substrate,
wherein the stress engineering layer ~~[[so to]]~~ increases ~~[[the]]~~ a tensile strain of the SiGe layer.

16. (Original) The SiGe-containing structure of claim 15, wherein said substrate comprises Si.

17. (Cancelled)

18. (Currently amended) The SiGe-containing structure of claim 15, wherein said ~~stress engineering silicide or germanide layer is formed by depositing a Ti layer on said second surface of said substrate by evaporation and then annealing at high temperature~~ comprises at least one of C54-TiSi₂, CoSi₂, and C54-TiGe₂.

19. (Currently amended) The SiGe-containing structure of claim 15, wherein said ~~stress engineering silicide or germanide~~ layer allows L-band photo-detection of said SiGe layer.

20. (Currently amended) The SiGe-containing structure of claim 15 further comprising a ~~dielectric n-oxide or nitride~~ layer disposed over said SiGe layer.

21. (Currently amended) A Ge-containing structure comprising:
a substrate;
a Ge layer ~~that is~~ disposed over a first surface of said substrate; and
a ~~silicide or germanide~~ stress engineering layer comprising at least one of silicide and germanide ~~that is~~ disposed over a second surface of said substrate,
wherein the stress engineering layer [[so to]] increases [[the]] a tensile strain of the Ge layer.

22. (Original) The Ge-containing structure of claim 21, wherein said substrate comprises Si.

23. (Cancelled)

24. (Currently amended) The Ge-containing structure of claim 21, wherein said ~~silicide or germanide~~ stress engineering layer is formed by depositing a Ti layer on said second surface of said substrate by evaporation and then annealing at high temperature comprises at least one of C54-TiSi₂, CoSi₂, and C54-TiGe₂.

25. (Currently amended) The Ge-containing structure of claim 21, wherein said ~~silicide or germanide stress engineering~~ layer allows L-band photo-detection of said Ge layer.

26. (Currently amended) The Ge-containing structure of claim 21 further comprising ~~an oxide or nitride~~ dielectric layer disposed over said Ge layer.

27[[28]]. (Currently amended) A photodetector comprising a Ge-containing structure produced in accordance to claim 1.

28[[29]]. (Currently amended) An optical modulator comprising a Ge-containing structure produced in accordance to claim 1.

29. (New) The method of claim 1, wherein said substrate comprises Si.

30. (New) The method of claim 29, wherein the step of forming the stress engineering layer comprises forming a silicide layer over said second surface.

31. (New) The method of claim 30, wherein forming the silicide layer further comprises depositing a metal layer on said second surface of said substrate by evaporation and then annealing at high temperature.

32. (New) The method of claim 29, wherein forming the silicide layer comprises simultaneously depositing a metal and silicon at a ratio of 1:2.

33. (New) The method of claim 6, wherein removing said second Ge-containing layer comprises etching.